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GEOGRAPHIC SCHOOL BULLETINS

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

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1. Capture of Gilbert Islands Pierces Japan's Eastern Shield
2. Christmas Candies Short on Mint
3. Industrial Bull's-Eyes Hit in Bombed Berlin
4. Reclaimed Sinkiang Is China's Wild West
5. Flying Freight Cars Take to the Sky

NOTE TO TEACHERS—Because of Christmas holidays, the GEOGRAPHIC SCHOOL BULLETINS will not be published for the next two weeks, resuming on January 3, 1944.

Dr. Raymond A. Dillon

QUIET FISHERMEN OF THE GILBERT ISLANDS HAVE HAD TO MAKE WAY FOR WAR

Dark Melanesian and coppery Polynesian strains have mingled in the ancestry of the 28,000 people who made their homes before the war on the Gilbert Islands. The Polynesian-type outrigger canoes of Gilbertese fishermen, catching oysters or flying fish, had to dodge war vessels and planes when the British-governed islands were overrun by Japanese invaders in 1941, captured by Americans last month (Bulletin No. 1).

GEOGRAPHIC SCHOOL BULLETIN

HOW TEACHERS MAY OBTAIN THE BULLETINS

The Geographic School Bulletins are published weekly throughout the school year (thirty issues) and will be mailed to teachers in the United States and its possessions for one year upon receipt of 25 cents (stamps or money order); in Canada, 50 cents. Originally entered as second-class matter January 27, 1922; re-entered as of April 27, 1943, Post Office, Washington, D. C., under Act of March 3, 1879. Copyright, 1943, by National Geographic Society, Washington, D. C. International copyright secured. All rights reserved. Quedan reservados todos los derechos.

Capture of Gilbert Islands Pierces Japan's Eastern Shield

A BRITISH sea captain in 1765 sighted a South Pacific isle of coral beaches and coconut groves just south of the Equator. For a long time English-speaking people gave more thought to the captain's grandson, the poet Lord Byron, than to the island discovery. But the coral island, Nukunau, was the white man's first introduction to the Gilbert Islands, now a focus of warfare in the Pacific.

In 1892 the British established a protectorate over the Gilbert group. In 1915 the islands were collected into the British Empire as part of the Crown Colony of the Gilbert and Ellice Islands. In December, 1941, Japanese invaders took the islands for bases. In November, 1943, the U. S. Marines took one step nearer to Tokyo as they drove the Japanese out. For the landing at Tarawa the Marines paid "the stiffest price in human life per square yard" in the history of the Corps.

166 Square Miles of Land in 800,000 Square Miles of Sea

The Gilbert group consists of 16 coral atolls strung out in a 500-mile-long crescent curving across the Equator. Each atoll is a rough circlet of low, long, narrow islets and wave-washed reefs enclosing a lagoon. The total area of the sixteen is but 166 square miles, surrounded by 800,000 square miles of the sea.

Yet these scattered bits of mid-Pacific dry land have a special value in this war because they flank supply lines between Hawaii and other island bases of U. S. forces in the South Pacific. Makin, formerly the chief Japanese naval base in the Gilberts, is 2,275 miles southwest of Oahu in the Hawaiian Islands.

Moving into the Gilberts, American fighting men are 900 miles nearer to Japan than are their bases in the Ellice Islands just to the south. Makin, for example, is 3,050 miles southeast of Tokyo, and only 1,450 miles southeast of Truk in the Caroline Islands, rated the chief Japanese naval base in the ring of Pacific islands forming the outer defenses of Japan (map, next page).

The Gilberts, before the war, were densely populated, supporting more than 27,000 people, or about 170 to each square mile. European residents numbered fewer than 100; Asiatics were even rarer. The Gilbertese are a tall, saddle-brown people (illustration, cover).

Missionaries built schools in practically every village, and a recent census showed 72 per cent of the islanders to be literate.

Robert Louis Stevenson Visited the Gilberts

The slim island strips produced little except dense coconut groves. Before the war the principal business activities of the people were the export of copra—the white meat of the coconut dried for processing into glycerine for explosives and soap—and the import of such modern conveniences as bicycles.

Robert Louis Stevenson visited the Gilbert Islands on his South Seas quest for health. He was impressed with the loud sudden rains, the almost intolerable heat of the tropical sun, the drowsing silhouette of palm trees against still lagoons, and the flashes of savagery among the gentle, childlike natives.

The group was named Gilbert in honor of a British captain who made a systematic voyage of discovery along the chain of islands in 1788. Native tradition holds that a redheaded white man was shipwrecked on the islands almost two centuries earlier, possibly a Spanish explorer. The isles were charted under the

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Maynard Owen Williams

THROUGH THE RED GATES OF GEZ, ASIA'S TWO-HUMP BACTRIAN CAMEL CLIMBS DOWN FROM ASIA'S ROOF INTO SINKIANG

Into Sinkiang, China's westernmost province, the trail from the south winds down to Kashgar past some of the loftiest mountains in the world—Qungur (25,146 feet high), Muztagh Ata (24,388 feet), and others. The route follows the valley of the glacier-cold Gez River (above) through the blood-red rock walls of the Red Gate, as the river rushes down northward into the peculiar Tarim River, whose waters die in the Takla Makan without ever escaping beyond the desert's rim. Caravans of camels tethered together (of the two-hump Central Asia type), ponies, and yaks carry much of their burdens packed in 60-pound units in wooden boxes called *yakdans*. Over this trail between Kashgar and Afghanistan and India goes little commerce but an important trickle of mail and official travelers. Until recently, in Kashgar British influence was predominant as Russian influence was in Urumchi to the north. Most people in this corner of Sinkiang are Kirghiz and Turki tribesmen. To the west across the Pamirs lies Bactria—now part of Afghanistan—the region from which the two-hump Bactrian camel took its name (Bulletin No. 4).

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Christmas Candies Short on Mint

"VISIONS of sugarplums" are no doubt dancing through youthful heads as usual this holiday season. But the youngsters should be warned not to dream too lavishly of peppermint candy canes, or their dreams cannot come true. The reason? The mint crop was small this year.

Early rains, late drought, and a shortage of farm labor have cut the United States harvest of commercial mint below expectations. Of the oil produced from the limited crop, medicine manufacturers, who normally are the chief users of peppermint, want far more than usual for their menthol medications and peppermint flavorings. From the mint oil they will make menthol to replace prewar menthol imports from the U.S.S.R., China, and Japan. For export to pharmaceutical manufacturers in Allied countries, lend-lease needs may take a fraction, possibly a fourth, of this year's mint oil. Since the demands of medicine come first, candy can have only the remainder.

Nineteen Pounds of Candy for Everyone Last Year

There are, however, these brighter sides to the peppermint picture. Many of the candy makers who supply Santa Claus have a good supply of peppermint oil left from last year.

Meanwhile, Brazil to the south is coming to the rescue. Mint plants transplanted from Japan before the war are supplying Brazil with oil to make menthol, which may be exported to the United States in sufficient quantity to ease the menthol pressure in the peppermint crisis.

Candy's share of the crop output may be measured by the fact that candy makers used about one-eighth of 1942's record peppermint oil production. Confectioners made more than 2½ billion pounds of candy in that year, or 19 pounds per person.

The average person's 19 pounds, however, claimed only one-fiftieth of one ounce of oil of peppermint for flavoring.

Mint was known and used by Hippocrates, "Father of Medicine," in the 5th century B.C. Peppermint came to America from England about 1816, and made its first home in Wayne County, New York. Within twenty years, however, it had moved west and was thriving in southern Michigan's swampland soil, where it has since gone into business in a big way.

Michigan and Indiana Hold Nation's Mint Acreage

Soon overshadowing English and German mint growing areas, the Michigan mint bed expanded into northern Indiana, where it has developed rapidly since World War I. Walkerton, Indiana, and Mentha, Michigan, are farm centers now for the industry whose mint-covered acres lie largely between South Bend and Kalamazoo.

Of the many members of the *mentha* plant family, three are best known to commerce. Rich muck land along the Indiana-Michigan border is the world center for two—*mentha piperita,* called the true peppermint, and *mentha spicata,* or spearmint. China, Russia, Brazil grow the third member, *mentha arvensis,* generally known as Japanese mint, long grown principally in northern Japan.

From peppermint and spearmint are distilled the aromatic oils prized for flavoring candies, chewing gum, toothpastes, jellies, liqueurs, and medicines. Spear-

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names of British sailors and ships—Pitt, Matthew, and Drummond, for instance. Current practice identifies the islands by their native names.

Tarawa, Makin, and Abemama were the first to be taken by American forces. Tarawa was administrative headquarters of the Gilberts under the British. Its prewar population was a little more than 3,000, including 23 Europeans, and its installations included a leper station, hospital, insane asylum, jail, radio station, and Roman Catholic mission. The Tarawa atoll is roughly triangular, with coral reefs forming one side and strings of channel-separated islands forming the other two. The chief settlement is on the small southwestern islet known as Betio. Japanese made Tarawa the site of their principal air base.

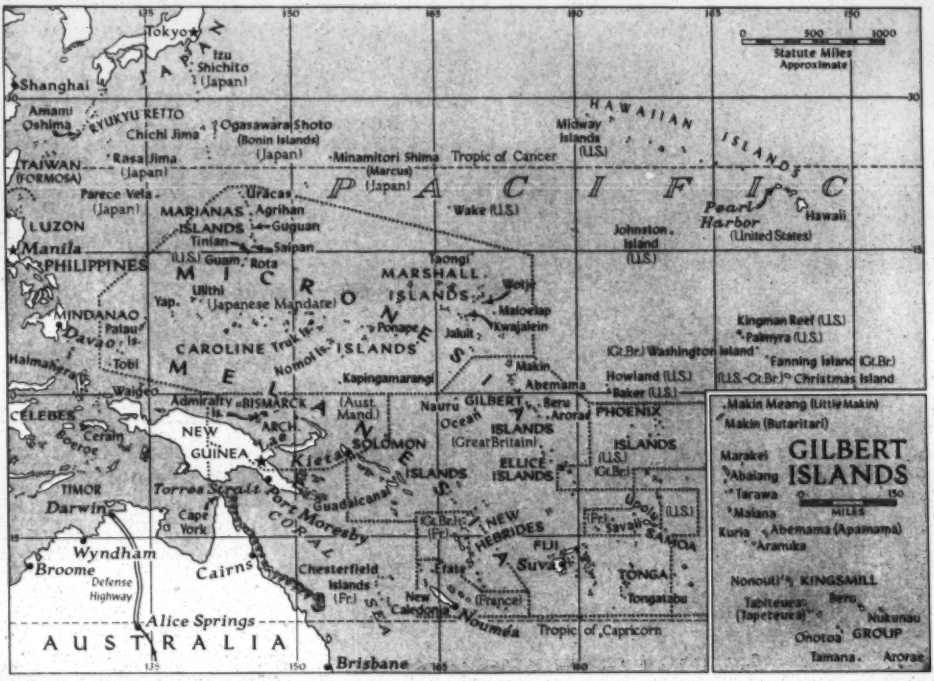
Makin is a similar string of islets and reefs around a central lagoon. Before the war Makin's inhabitants numbered 1,700, with 15 Europeans. The Japanese converted it into a naval and seaplane base.

Low-lying Abemama, of similar coral atoll structure, was the prewar home of some 800 people. It had a government office, mission, school, and trading post.

NOTE: The Gilbert Islands are shown on the National Geographic Society's Map of the Pacific Ocean and the Bay of Bengal. This map contains large-scale insets of the islands of Makin and Tarawa. A price list of maps may be obtained from the Society's headquarters in Washington, D. C.

See also "War Finds Its Way to Gilbert Islands," in the *National Geographic Magazine* for January, 1943.

Bulletin No. 1, December 13, 1943.



Drawn by Richard L. Reish

THE GILBERTS GIVE AN EASTERN CLAW TO PINCERS AROUND JAP BASES

Pushing northward into territory Japan formerly held in the Solomon Islands and New Guinea, Allied forces are creating a pincer movement by another northward drive farther east, from bases in the Ellice Islands to newly captured islets in the Gilbert group. These two Pacific battlegrounds, some 1,800 miles apart, appear to be the two claws of pincers reaching toward the Caroline Islands, where Japan has established defensive bases, notably at Truk. American forces entered the Gilberts by seizing three atolls in the northern half of the group (inset): Makin, Tarawa, and Abemama.

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Industrial Bull's-Eyes Hit in Bombed Berlin

BERLIN, target of history's heaviest aerial bombardment to date, attracted bombers because it was more than a mere seat of German government. It was one of the mightiest industrial and commercial cities of Europe, and the key point for transportation throughout Germany.

Capital of old Prussia and of modern united Germany, Berlin is a new city as European towns go. Its spectacular growth to a prewar rank of second largest city on the Continent, third in Europe, and fifth in the world came almost entirely within the past 125 years. Few of its notable buildings were more than 100 years old. Berlin's historic monuments, art galleries, museums, palaces, and churches do not compare in antiquity or in cultural importance with many in London, Malta, Rotterdam, Kiev, and Warsaw.

Canals Link Rivers to Form Inland Port

Prewar Berlin, with 4,355,000 people, was surpassed in population only by London, New York, Paris, and Tokyo. Its 341-square-mile area is spread over flat marshy land along both banks of the Spree River. Forests, lakes, and streams, once popular in summer as park playgrounds for Berliners, provide the scenic setting for the city.

As the government and business heart of the German Reich, it was the focus of peacetime German affairs just as it is now spotlighted by Nazi war activities.

Berlin's industrial plants absorbed huge quantities of raw materials for the manufacture of war supplies. Vast stores of coal, oil, hides, paper, steel, and building materials were unloaded at its miles of docks along the Spree (illustration, next page). A network of canals supplementing the Spree and near-by rivers gave Berlin extensive shipping facilities. It ranked after Duisburg-Hamborn on the Rhine as Germany's second-busiest inland port. Berlin was served by 20 important railway stations.

War Plants Crowd the Suburbs

Berlin has specialized in manufactures requiring high technical skill. Electrical equipment, machinery, chemicals, scientific instruments, office machines and supplies, locomotives, furniture, pianos, and bicycles are among the products once shipped from its factories.

Berlin's practice of building houses and factories practically side by side has subjected civilian life and homes to destruction along with such bombing targets as electrical and chemical works, machine shops, railroad yards, and vital war plants. In every section of the city the industrial and the domestic life are closely merged. The great industrial plants which are concentrated in the Berlin area have been the nucleus about which have grown up suburban towns such as Pankow to the northeast; Lichtenberg, at the eastern edge of the city; Neukoeln, in the southeast; Wilmersdorf, to the southwest; and Siemenstadt, site of the tremendous Siemens Electrical Works, to the northwest. All of these districts, together with the Wilhelmstrasse, the Pariser Platz, and the Alexander Platz in the heart of the capital, are reported heavily damaged.

The west and southwest sections of the city are predominantly residential. Academic, scientific, and military institutions are concentrated in the northwest. The northern part of the city has the bulk of machinery works; woolen factories

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mint is the popular mint of suburban kitchen gardens, used to make mint sauce and to adorn and flavor summer drinks. Japanese mint, wherever it is grown (including California), is inferior for flavoring but from it can be crystallized more menthol, used in medicines for colds and in "cooled" cigarettes.

Mint Blossoms Are Harvest Signals

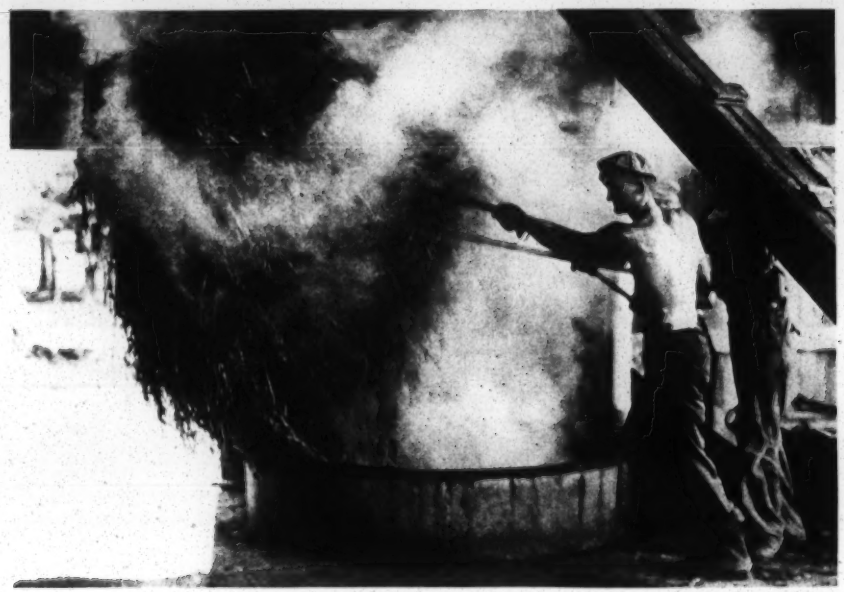
Crop estimates tell the story of the 1943 slump in mint oils. Both peppermint oil and spearmint oil are about one-third off the 1942 record.

Decreased acreage is one reason for the slump. Indiana-Michigan mint farmers cultivated 29,600 acres in 1943, or 4,000 acres less than last year. Oregon, Washington, California, and Ohio showed little change in areas under cultivation. Commercial spearmint acreage, centered more exclusively in Indiana and Michigan, increased slightly.

The mint growers work harder than other farmers to keep out weeds because of their effect on the quality of mint oil. Mint is harvested when its earliest blossoms appear. It is allowed to wilt in the sun briefly to remove excess moisture before being taken to the stills (illustration below).

NOTE: For further information about food, see "Revolution in Eating," in the *National Geographic Magazine* for March, 1942. See also the following articles on Christmas in the GEOGRAPHIC SCHOOL BULLETINS: "Christmas Comes with the Kings, South of the Border," December 14, 1942; "Pesky Mistletoe Makes Christmas Merry and Mischievous," December 15, 1941; and "Santa Claus's International Family," December 16, 1940.

Bulletin No. 2, December 13, 1943.



Willard R. Culver

HOT STEAM MAKES MINT SURRENDER ITS COOLING FLAVOR

Harvested mint is dumped into the vats of the peppermint still, where live steam stews out its flavorsome juices. The steam opens the tiny cells of each plant, and carries off the droplets of mint oil. Steam and oil are piped from the vat into coils of tubes, where the steam condenses into water. Oil and water separate by gravity. All the mint from one acre will yield 60 pounds of peppermint oil as a maximum. The average yield for an acre's mint in 1942 was 33 pounds; this year, because of rain and drought conditions, the average may be no more than 23 pounds. The de-minted mass of mint plants, after removal from the vats and drying, serves as fodder for livestock. This still was photographed in northern Indiana not far from South Bend, in the heart of the nation's giant two-State mint bed, which reaches from Indiana into Michigan.

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Reclaimed Sinkiang Is China's Wild West

IN the cold mountains and desert reaches of Sinkiang, in westernmost China between northern India and the southeastern U.S.S.R., Chinese, British, and Russian authorities have had overlapping influence. Now the withdrawal of Russian influence has left Chinese authority dominant. This friendly development on the diplomatic front has been likened to the surrender earlier this year of extraterritorial privileges in China by Great Britain and the United States.

Since silk caravans padded through its dusty deserts and oasis towns, Sinkiang has made much history but little news. It has few doors to the outside world. It is imprisoned between the towering Kunlun ranges of the south and the rugged Tien Shan (Heavenly Mountains) on the northwest and the Altai Mountains on the northeast. Shutting in the southwest corner are the Pamirs, long known as the Roof of the World for their lofty plateaus walled with peaks more than four miles high. Eastward from Kashgar and from Urumchi, two branches of an age-old trade route from western Asia to China wind through deserts pocked with salt marshes, walled with steep hills, and dotted with colorful oasis towns.

A Slice of Asia's Heart Land

Sinkiang is China's share of the Turkistan of old (land of the Turkis), that broad belt of mountainous Central Asia with one end in China and the other on the shores of the Caspian Sea. The old region is now patterned with jigsaw slices of Soviet Central Asia—the Tadzhik S. S. Republic, the Kirghiz (Kirgiz) S.S.R., the Kazakh, Uzbek, and Turkmen S.S.R.'s, with Sinkiang on the eastern end.

Sinkiang, with more than 500,000 square miles, is no dwarf domain. It could hold Texas, California, Washington, and Oregon, and have space left over for Alabama. From its highest peak to its "Death Valley" floor below sea level in the Turfan Depression, the land has a top-to-bottom range of about 4½ miles. It is the homeland of about 1,200,000 people, many of them of Turki descent.

Urumchi (Tihwa), to the north of the 14,000-foot Bogdo Ula Mountains, is the capital. As early as 1932 this desert city was connected by regular air service with northern China to the east, the U.S.S.R. to the west, and Europe.

Water from the mountains charges into stream beds that merge in the north to form the Tarim River drainage system edging the great central desert, the Takla Makan. Except at flood stage, many mountain streams end in the greedy sands.

Orchards Surround Fruitful Islands in Deserts

Valley oases have long provided town sites. Yarkand, Kashgar, and Aqsu (Aksu) were known far beyond the borders of Sinkiang. Dusty highways more or less improved connect towns (illustration, inside cover). Khotan in the south has been a way station for travel over the Himalayas to Tibet and India. The country has no railways. The nearest rail line is the Turkistan-Siberian system to the west in the U.S.S.R.

Approaching Yarkand from the south, a traveler would be impressed with the fertility of the oasis soil. In the growing season the land is green with orchards. Apples, pears, peaches, apricots, and mulberries do well. From well-watered patches come wheat, rice, cotton, tobacco, and especially luscious melons.

Oasis communities have been known for their handicrafts. The products of

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are in the northeast; dyeing, furniture, and metal industries cluster in the east and southeast. The railway shops are situated mostly in the south.

The broad mile-long stretch of boulevard known as Unter den Linden (Under the Lindens) is the heart of Berlin. The old lindens along the central promenade were uprooted when a new subway was built under the double avenue. Young trees which replaced them before the war broke out were so small that the parkway was sometimes referred to by local wits as "Under the Street Lamps."

Along Unter den Linden were the University of Berlin, the State Library, and a number of the city's shops and hotels. The street begins in the west at the edge of the once-beautiful park, the Tiergarten, at the Brandenberger Tor (Brandenburg Gate), which is a symbol of Berlin as the Arc de Triomphe is of Paris. At the east end, Unter den Linden reaches to the old royal palace (now a museum) and the Lustgarten square. South from Unter den Linden runs the Wilhelmstrasse, flanked by the Chancellery, the Ministries of Justice and State, and other government buildings. The Ministry of Munitions, headquarters of German war production, was listed among the structures wrecked.

Across the Pariser Platz from the Brandenburg Gate is the site of the U. S. Embassy, and that of the Reichstag is near by at a corner of the Tiergarten.

NOTE: Germany is shown on the National Geographic Society's Map of Central Europe and the Mediterranean.

Bulletin No. 3, December 13, 1943.

T. R. Ybarra

BERLIN WEDGED LIBRARIES AND MUSEUMS BETWEEN WAR PLANTS AND DOCKS

This group of historic buildings in Berlin stands on an island between two branches of the traffic-laden River Spree, wedged between munitions works, boat yards, chemical plants, and railroad shops. To serve the war plants, loaded barges were tugged through the heart of the city. Past the 45-year-old City Library (left), under the Kurfürsten Bridge, and past the Schloss Museum (center) traffic crowded this eastern branch of the river. Around a bend beyond the domed Protestant Cathedral (right background) the western branch joins the eastern and the Spree makes its way past the Reichstag to another concentrated cluster of shops and factories for war supplies. The bronze equestrian statue of Frederick William, the "Great Elector," above the bridge's center arch, faced downstream toward the museum, formerly a palace where he lived in the 17th century.

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Flying Freight Cars Take to the Sky

CHRISTMAS and war—with a congestion of homecomings and battlefronts, and shipments of incredible tonnages of mail and freight, Christmas presents and war supplies—have put a previously unheard-of burden on the transportation facilities of the United States. One help in staving off breakdown under the holiday stress was this year's vast boom in traffic along the highways of the air.

A typical wartime development in the transportation field is the Air Transport Command of the U. S. Army Air Forces. Only in June, 1941, did this organization come into existence. Its first faltering steps were limited to chores connected with delivering completed lend-lease airplanes to specified points within the U. S. The ATC entered this year, however, with a network of air routes aggregating 90,000 miles, over which its combat planes are flown to war fronts and its cargo planes carry freight of infinite variety.

Live Baby Chicks Pioneered as International Air Cargo

A sample of ATC air cargo is mail to and from soldiers, tons of it. In a single month of this year, in the Africa-Middle East sector alone, ATC planes carried some 29 million pieces of mail.

Ammunition and airplane engines (illustration, next page) appear on lists of ATC cargo battlefront-bound. Homeward trips bring such raw materials as diamonds, rubber seeds, silk.

Civilians, too, have their flying freight cars. Express shipments have been crossing international frontiers by air since 1931, when Pan American Airways transported 146 hatching eggs from Florida to a Latin American customer. From that experiment developed an unusual traffic in air-shipped baby chicks dispatched from the United States to South American markets.

Commercial air express shipments across the Atlantic started in 1941 with a 40-pound payload routed through Lisbon, Portugal.

For flying shipments within the United States, commercial air express began earlier, taking off in September, 1927, from a pioneer service limited to 26 cities. In 1928, the first complete year of the new service, it handled 17,000 shipments; in 1942, the latest complete year, it handled nearly 100 times as much, or 1,405,000. That was an average of 35 tons a day. By April, 1943, air express shipments had reached a monthly volume of two and a half million pounds. These fast-moving parcels traveled over 18 airlines which together aggregated 45,000 flying miles.

These tonnages wafting through the air do not consist of mere lightweight luxuries, such as flowers and latest-style Easter bonnets. The list of airborne shipments is headed by machinery, electrical parts, and hardware; these items amount to 27 per cent of the total weight of airborne shipments.

New Short Cut Across Gulf of Mexico

Much of this is emergency shipping, to replace broken parts that are slowing up production in factories and mines. A typical shipment was that rushed to Nevada to repair some mining machinery broken in an accident. The breakdown occurred on a Saturday afternoon. Within twenty minutes the replacement had been ordered by phone from Bridgeport, Connecticut. In less than two hours the new part had been boxed and dispatched to the nearest airport. It reached Nevada late Sunday; by the opening hour on Monday morning it had been installed.

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these local skills—carpets, rugs, silk and cotton fabrics, metal work, and leather goods—were the stock-in-trade of the bazaars. The carving of jade, mined from the rich beds in the south, was a major specialty in Khotan.

Mongolians invaded Sinkiang about 170 B.C. For several centuries Chinese, Tibetans, and Mohammedans from the west contested footholds. Another wave of Mongols rolled over the country in the 11th century. Genghis Khan battered his way across Sinkiang to establish his power farther west.

Under Mongol rule religious tolerance was notable. Buddhism and Nestorian Christianity spread rapidly across this dusty road to India and China. The country prospered, the arts flourished. Marco Polo found much to admire in Chinese Turkistan in the 13th century.

In 1872 the country became nominally a Chinese province, its larger towns garrisoned with Chinese troops. Proximity to the Tadzhik and Kirghiz S. S. Republics, in the U.S.S.R. on the west, together with the completion of the Turkistan-Siberian Railway, made Sinkiang a continuing sphere of Russian interest.

NOTE: Sinkiang may be located on the Society's Map of Asia and Adjacent Areas.

For additional information, see these articles in the *National Geographic Magazine:* "With the Nomads of Central Asia," June, 1936*; "From the Mediterranean to the Yellow Sea by Motor," November, 1932*; "First over the Roof of the World by Motor," March, 1932*; and "On the World's Highest Plateaus," March, 1931*. *(Issues marked by an asterisk are included in the special list of Magazines available to teachers at 10¢ each in groups of 10.)*

Bulletin No. 4, December 13, 1943.

Maynard Owen Williams

SINKIANG'S PORTABLE HOME IS BUILT WITH WOOL, WATER, AND YAK-POWER

The nomadic Kirghiz tribesman of southwest Sinkiang has a doomed house (*yurt*) of wool felt mats lashed to a lightweight frame, all of which can be taken apart, rolled up for yak-back carrying, and easily transported to a new site when he moves on with his herds of sheep and yaks. Men and women work together making the felt mats, while the children watch. A layer of raw wool is spread evenly over a long strip of reed matting and rolled up like a jelly-roll into a smooth cylinder. As the wool is rolled under, it is sprinkled with water from a bucket (above). Roped up and hitched to a yak, the cylinder is dragged up and down over the plateau until the wool has matted into a tough felt. As the cylinder is unrolled for inspection, the men iron out any rough or lumpy spots by rolling the cylinder back and forth under their forearms. Then the felt mat can be appliquéd with decorative patches of colored felt or leather, and a new house receives its wool wall.

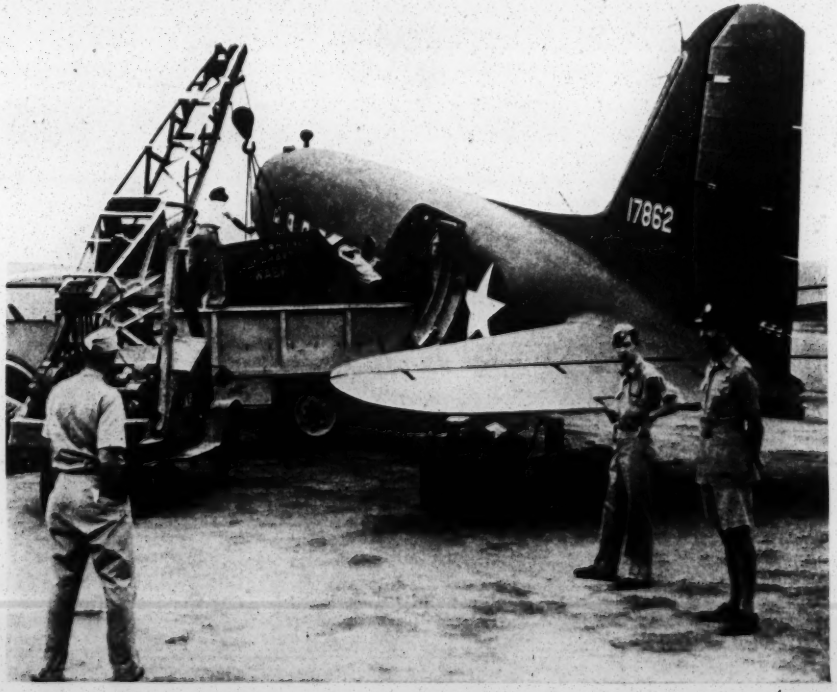
Many of the first mail and express planes were single-engined, open-cockpit biplanes. Packages were stowed wherever there was room; often the pilot sat on the cargo. Coast-to-coast shipments required 36 hours and 16 re-fueling stops. Today a transcontinental shipment makes an overnight flight in 16 hours. Some of the planes for service to South America now carry one ton of express cargo and mail, and 35 passengers as well. They are four-engined monoplanes made of metal, manned by crews of six.

The latest step in speeding air shipments to Central and South America is the opening of an international airport at New Orleans, supplementing the southern air portals at Miami, Brownsville, El Paso, and Los Angeles. This development enables the airlines to link more than 200 cities in South and Central America with 350 cities in the United States.

From New Orleans the new air route bisects the Gulf of Mexico from north to south and heads for Balboa in Panama, with stops at Merida in Mexico, Guatemala City in Guatemala, and Managua in Nicaragua. The four-engined transports cover the 2,000-mile route to the Canal Zone in twelve flying hours. This service taps Central America for air shipments of rubber, tea, quinine, copra, vegetable oils, and many other products.

NOTE: For additional information on air transportation, see "American Wings Soar Around the World," in the *National Geographic Magazine* for July, 1943; and "American Transportation Vital to Victory," a series of full-color reproductions of paintings which includes scenes showing air transport, in the December, 1943, issue of the *Magazine*.

Bulletin No. 5, December 13, 1943.



Acme

THIN AIR NOW CARRIES EVEN THE HEAVIEST OF CARGOES TO WARFRONTS

In civilian air express, emergency shipments of heavy machinery like mining equipment top the list of cargoes now carried by plane. The Air Transport Command of the U. S. Army Air Forces also responds to the necessity of putting wings under urgently needed heavy shipments such as anti-aircraft ammunition or airplane engines. The Pratt and Whitney engine in the photograph is starting a speedy flight from a base in Iraq to another Middle Eastern base.